

## SHOULDER- AND NECK HOLDER

### CROSS REFERENCE TO RELATED APPLICATIONS

5 This is an international application number PCT/DE98/03271 (WO 99/24292, European Patent EP 1 037 771 B1, German Patent DE 197 58 498 C2) filed Nov. 10, 1998 and claiming the priority of DE 197 58 498 A1 filed Nov. 11, 1997.

10 1. Field of the Invention:

The present invention relates generally to a shoulder- and neck holder, which restrains the shoulders and neck of a belted passenger, an anti-submarining seat-belt assembly as well as a safety seat in order to dampen vibrations and substantially reduce the acceleration-depending loads below the injury-related values

- in an event of arbitrary accident of a vehicle, train or an aeroplane or
- in an inflight turbulence.

15 2. Discussion of the Related Art:

It is known in the prior art to provide

- a three-point seat belt (safety belt or lap-shoulder seat belt) consisting of a shoulder belt extending across the torso and of a lap belt extending across the lower part of body in motor vehicle;
- a two-point seat belt acting as lap belt extending across the lower part of body in an aeroplane or a rear seat of vehicle or
- a seat-belt substitute for restraining the shoulders, upper part of the body and/or neck.

In order to formulate in single terminology a generalized definition for the proper term is presented:

25 "belt portions 1.1, 1.2, 1.3 and 1.4" for members of a multi-point seat belt 1a to 1d (Figs. 1, 14) ref. to EP 1 037 773 B1 (WO 99/24294, PCT/DE98/03270, DE 197 49 780 C2). The upper part of body is restrained by extending the shoulder belt portions 1.1, 1.2 crosswise in an „X-shape” while the lower part of body is restrained by the lap belt portion 1.3.

30 "belt portions 1.2, 1.3 and 1.4" for members of a three-point belt 1e to restrain the upper part of body and to restrain the lower part of body, shown in Fig. 14;

"belt portion 1.3" for conventional two-point or lap seat belt;

"floor 6" for vehicle-, train- or aeroplane floor (Fig. 14);

"seat frame" for frame of seat backrest or seat-cushion;

35 "accident" of a vehicle, train or aeroplane for front-, side-, rear collision of a vehicle or pile up (mass accident) or for train-, aeroplane accident or turbulence-related vibrations of an aeroplane;

"energy-absorption" for absorption and release of impact energy as well as dampening vibrations;

40 "undampened energy-absorption" for absorption and release of impact energy while vibrations are undampened;